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ABSTRACT

A comparative analysis was made in the Netherlands of three projects aimed at answering the following research questions: (1) what are the backgrounds and characteristics of the methods for the construction of qualification profiles (a description of the knowledge, skills, and attitudes required for job performance) for the curriculum and training design used in these projects? and (2) what are the advantages or disadvantages of the application of these methods? Models were constructed for the analysis of methods, and data were gathered through analysis of project documents. A comparative analysis was also performed. The three projects used these procedures: the Mantelproject procedure, Frey's curriculum conference approach, and the conference model of the National Institution for Curriculum Development. The Mantelproject procedure aims at the identification and clarification of those elements of occupational practice that are considered relevant for vocational training. In the curriculum conference approach, representatives of different institutions try to reach consensus about the objectives and content of a curriculum to be developed during a 2- to 3-day deliberation. The curriculum conference model is a strongly structured group deliberation procedure of 3 days. Results were analyzed and compared, showing the advantages and disadvantages of each research method, with each shown as valuable for different situations. (29 references) (KC)

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Adapting vocational curricula to changes in business and industry; a comparative analysis of three cases

first draft

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1. Introduction

The relationship between education and labour has become more and more problematic over the last decades. On the one hand society has been confronted with an unemployment rate, unknown since the thirties, no longer striking only the lower educated. On the other hand there is an increasing amount of signals relating to the qualitative discrepancies between school and work. The introduction of new technologies and especially the speed of these developments lead to ongoing changes in qualification demands as well as to the obscolescence of existing curricula in vocational education and business training. At the same time it is unclear in what direction or to what level these changing qualification demands will lead. Diverse concepts as upgrading, downgrading, regrading and polarization are used alongside as an interpretation of these developments (Spenner, 1985).

In the Netherlands several projects have been carried out, in which methods for task analysis and performance requirement analysis have been used for the purpose of designing and updating vocational curricula and training courses. By means of such methods qualification profiles are constructed, which can be transformed into training profiles. A qualification profile can be conceived of as a description of the knowledge, skills and attitudes required for occupational performance. A training profile is a plan or design for a curriculum or course in which not only the required knowledge, skills and attitudes are described, but also the opinions and principles based on a certain philosophy (Finch & Crunkilton, 1984) and which forms the starting point for curriculum development.

Although there is quite some variation in the methods used in the above mentioned projects, their general aim is basically the same. This aim can be characterized as the reduction of qualitative discrepancies between vocational programs and occupational practice by means of a more or less systematic procedure with which occupational information is gathered for the benefit of curriculum and training design. Both educational policy and educational practice show a growing interest in the adequacy and applicability of such methods. The research presented in this paper concerns a comparative analysis of the above mentioned methods, which have been used in the Netherlands[1]. Central question of this research is: which are the principles, applications and and effects of methods for the determination of qualification profiles and the transformation of these profiles into educational objectives for the purpose of bridging the gap between school and work?

In this paper we present the first results of this research; a comparative analysis of three cases (or projects) aimed at the answering of the following research questions:

- what are the backgrounds and characteristics of the methods for the construction of qualification profiles on behalf of curriculum and training design used in these projects;
- what are the advantages or disadvantages of the application of these methods[2].

Before we launch into the description and analysis of the three projects, it is neccessary to give a brief sketch of the nature of qualitative problems in the relationship between education and labour as well as the backgrounds and motives for our research (section 2). In section 3 we will describe the design of the research. In the following sections a description and analysis of the cases is given (section 4 and 5).

2. Description of the problem and the research questions

A distinction commonly made regarding the problems in the relationship between education and labor, is the distinction between quantitative and qualitative problems (Van Hoof & Dronkers, 1980; Hövels, 1985; Hövels & Peschar, 1985; Nieuwenhuis & Silverentand, 1986; Van Hoof, 1987a, 1987b). Quantitative problems refer to discrepancies of numbers or discrepancies between the amount of the demand for labour on the one hand and the amount of supply of labour on the other hand.

Qualitative problems can be defined as discrepancies between the quality of the supplied labour and the quality of the demanded labour. That is to say, discrepancies between the content and level of the available qualifications and the content and level of the qualifications that are required for the perfomance of specefic jobs. The distinction between quantitative and qualitative discrepancies is mainly an analytical one; in reality these two types of problems are much intertwined and it is not easy to draw a clear demarcation between the two.

Qualitative problems in the relation between education and labour can be divided into four categories: problems with the provision of personnel, distribution problems (problems which occur at the labour market), problems with the provision of qualifications and utilization problems (problems which manifest in the labour organization). The problems with regard to the provision of personnel and qualifications refer mainly to the perspective of the employers; the distribution and utilization problems refer to the perspective of the employees (Van Hoof, 1987a, 1987b). These four types of qualitative problems can be described as follows:

1. **problems with the provision of labor** concern mainly discrepancies in the correspondence between the numbers of people (school leavers) with a certain type of education and the demand for this type of education on the labour market. Although this is not the most pressing problem at the moment, there are difficulties with recruiting

personnel for the high technology industry and information technology sectors. It is espected that these difficulties will spread to other types of education in the near future (Van Hoof, 1987a, 1987b; OSA, 1988);

2. **problems with the provision of qualifications** refer to the question how well our schools are doing in the preparation of (young) people for the job market. On the one hand the unemployment figures show that school leavers, who have only finished general education, have fewer job opportunities than those who have finished a vocational training. On the other hand the ongoing technological and organizational innovations and their translation in changing qualification demands, lead to the obscolescence of existing curricula in vocational education (Hövels, 1985; Van Hoof, 1987a, 1987b; OSA, 1988);
3. **problems of distribution** refer to the uneven spread of the number and quality of the available jobs. Especially school leavers (with an unfinished education or lower education), etnical minorities and women are the most affected groups. This distribution problem is aggravated by the 'displacement' processes on the labour market, through which the higher educated take up the jobs which were formerly occupied by lower educated (Hövels, 1985; Van Hoof, 1987a, 1987b);

d. **utilization problems** concern the discrepancies between the qualifications a person disposes of and the qualifications demanded by the job to be performed. A commonly heard explanation for these utilization problems is the increase of the average level of training, while the level demanded for job performance stays behind. Such utilization problems lead to waste of qualifications with negative consequences for both employees and employers (Hövels, 1985; Van Hoof, 1987a, 1987b; OSA, 1988).

The problems with regard to the relationship between education and labour are at the center of educational and employment policy. With that the attention is not only focused on the fight against unemployment, but also on the possibilities to reduce qualitative discrepancies as just described. Recently the Dutch Department of Education and Science (DES) has published a policy document containing proposals for reducing the qualitative discrepancies. The key opinion of this document is to derive the content and goals of vocational curricula from occupational information, by means of the development of qualification and training profiles. The basic assumption underlying this approach is the presumed possibility to analyze the qualitative aspects of the relation between education and labour by means of a confrontation between the content of a certain vocational curriculum or training course with the content of the presupposed related functions (DES, 1986).

In the past years several methods have been developed for the construction of qualification and training profiles. The new policy of the DES, as elaborated in the above mentioned policy document, aims at the large scale use of such methods in vocational education.

However, these methods have recently been severely critizised as being 'naive'. The critiques concern on the one hand the conceptualization of both the relationship between education and labour and the qualitative problems within this relationship and on the other hand the methodological and practical characteristics of these methods. The core of this critique can be summarized as follows:

- the erroneous assumption of univocal and exclusive relations between training and jobs or professions.

  In reality it appears that students who have completed a certain course can choose between alternative jobs; job requirements are formulated in such a way that these can be tackled by different types of graduates;
- a static perception of the relationship between education and labour.

  Attention is paid only to the confrontation between supply and demand at the labour market. Underlying factors and processes, like the structure of the labour market and its intermedairy function, are ignored;
- a technological determinism.

  Job requirements as formulated through the labour organizations, are conceived too much as only influenced by technological developments. The influence of factors within the labour organizations themselves and the educational system are underestimated;
- an one-sided emphasis on qualifications that have been acquired through schooling and training.

  The role of job experience and qualifications gained outside the educational system as well as the role of background factors as sex, age, race and social background, are not taken into consideration. Next to this there is too much emphasis on technical-instrumental qualifications.

Beside the above mentioned characteristics, the critiques are also directed at the time consuming character of much of these methods and at the risk of making educational programs scantier, which is included in the use of task analysis methods (Vlaskamp & Hövels, 1979; Van Hoof & Dronkers, 1980; Hövels & Peschar, 1985; Hövels, 1985; Van Hoof, 1987a, 1987b).

It is against this background that the research presented here has been taken up. The comparative evaluation of the projects in which such methods have been used, has to lead to

criteria and indications with regard to the method (or mix of methods) which is the most useful for educational policy and curriculum development practice.

3. Design of the research

To be able to describe and analyze the projects, which are quite divergent of each other, the following analysis scheme has been developed.

Figure 1. Model for the analysis of 'naive' methods

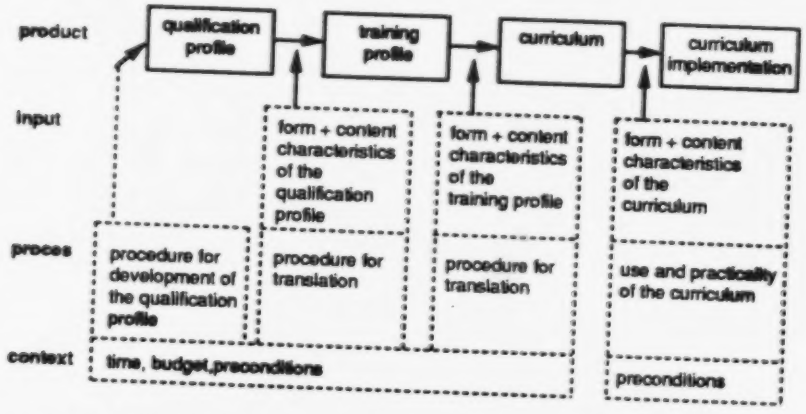


Figure 1 represents both the different stages in each of the projects and the factors influencing the transition of one stage to the other. These characteristics are conceptual as well as methodological and practical.

We have made a distinction between the product or input level on the one hand and the process and context level on the other hand. The elements on the product and input level are defined as follows:

- qualification profile: a collection of characteristics representing the core of the job/profession and describing knowledge, skills and attitudes required for the performance of that job/profession;
- training profile: a plan or design for a curriculum or course which is on one hand based on the qualification profile and on the other hand includes opinions and principles, derived from a philosophy (Finch & Crunkilton, 1984). Such a philosophy can also be defined as a 'design' (Saylor, Alexander & Lewis, 1981) or as a 'curriculum concept' (McNeil, 1981). We conceive a curriculum concept as the ideas about what should be taught, to whom, when and how (McNeil, 1981);

- curriculum: a planning document at the macro level as well as at the meso and micro level in the educational system (Nijhof, 1983);
- curriculum implementation: the actual use of a new curriculum or new curriculum materials at an arbitrary moment (Fullan & Pomfret, 1977; Fullan, 1981; Wolbert, 1981)[3].

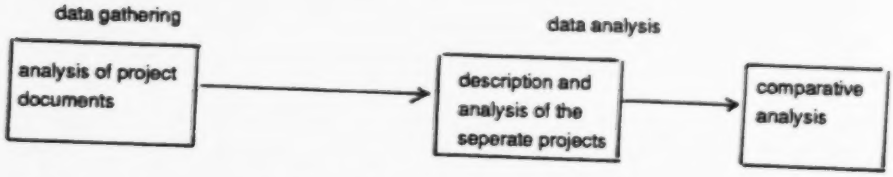
We assume that once a product is developed, it will form the input for the development of the successive product and therefore the characteristics of one product will influence the characteristics of the subsequent product(s).

The elements at the process level refer to the way in which the project is carried out; that is to say the procedures that are used to develop the successive products as well as the organizational structure of each of the projects (actors involved, tasks performed by these actors). The elements at the context level concern mainly the preconditions under which the projects have to be carried out. For example: time, budget, available staff.

This analysis scheme forms the frame of reference for the data gathering and analysis[4].

In figure 2 below, a schematic representation is given of the data gathering and analysis.

Figure 2 Data gathering and analysis



Document analysis is used as data gathering technique. Out of each of the projects several project documents are available. In principle these documents are: a background document (e.g.: a description of the method for construction of qualification profiles and training profiles that is used in the project, the plan for the project), a (research) report containing a description of the development process, the qualification profile, the training profile and the curriculum.

The documents are analyzed by means of a systematic procedure that has been developed in a former research project carried out by the Research Center for Applied Educational Research (Weesie & Ten Brummelhuis, 1986; Brandsma & Ten Brummelhuis, 1987; Ten Brummelhuis & Brandsma, 1988). This data gathering procedure has included the following steps:

a. Encoding

For the encoding of the documents 'meaningful codes' (Miles & Huberman, 1984) have been developed which represent the research variables. These codes were on the one hand based on the results of our literature study and on the other hand derived from a first screening of the project documents. To make the encoding of the documents possible, each of the documents was divided into textual fragments which form the entities of judgement or the observations.
All fragments were judged by a pair of independent raters, whose task was to assign one or more meaningful codes to each of the fragments. Assignment of (a) code(s) meant that a particular fragment contained information with regard to the variable presented by that code.

b. Identification

Each of the thus encoded fragments (hereafter called observations) was also provided with an administrative identification. This identification has to facilitate tracing back the source of the data. That is to say to trace back the original document from which an observation was derived.

c. Storage

All observations were stored in a computer database including the assigned meaningful codes and the administrative identification. The storage was completed with a summary of the textual information that was enclosed in an observation.

d. Rearrangement and selection

By means of the computer program (dBase III+) it was possible to rearrange and select the data as a starting point for description and analysis of the projects. The principle for this rearrangement was formed by the meaningful codes, so that observations to which the same code was assigned, could be selected. Such clusters of related observations (or textual fragments) formed the base for the description and analysis of the projects.

As shown in figure 2, two phases are distinguished in the data analysis. The first phase consists of a description and analysis of the seperate projects. This first phase is necessary to make a reconstruction of the development process, since most of the projects have already been terminated. This reconstruction enables a description of each project structured through the variables on which the projects will be compared. It also facilitates a first interpretation of the factors that have influenced the outcomes and the efficiency of the projects. Next to that, this phase is of importance for the comparison of the intentions of the projects and especially

the intentions of the methods applied in the projects with the actual performance and outcomes of the projects.
The second phase includes the comparative analysis of the projects.

Sections 4 and 5 concern the description and analysis of three projects in which different methods for the construction of qualification and training profiles have been applied. These three projects are:

- a project of the National Foundation for Training in Retail Functions (Dutch abbreviation: OVD) aimed at the functions of salesmen/women, hereafter referred to as the OVD-project;
- a research project called 'Generic knowledge, skills and attitudes on computer applications in office automation and flexible production systems', carried out by the Department of Educational Technology of the University of Twente, hereafter referred to as the Bavbo-project (after the Dutch abbreviation of the projects name, Bavbo);
- a project of the Dutch Professional Association of Ergotherapists (Dutch abbreviation: NVE), hereafter referred to as the ergotherapists-project.

4. The intentions of the applied methods

In this section we will give a description of the main characteristics of the methods applied in the above mentioned projects. This description is meant to facilitate the understanding of the proceeding of each project. These methods are: the Mantelproject procedure (applied in the OVD-project), the curriculum conference approach of Frey (applied in the Bavbo-project) and the conference model of the National Institution for Curriculum Development (SLO), which has been used in the ergotherapist project.

a. The Mantelproject procedure

The method applied in the OVD-project has been developed in the years between 1979 and 1983. The development of this method was a result of a cooperative project in which several national organizations participated. This project, called the Mantelproject, was organized by the Pedagogical Center for Apprenticeship Learning (Dutch abbreviation: PCBB), which is one of the educational support institutions in the Netherlands. In 1983 an extensive manual was published.

Since that time the method has been applicated by 16 national organizations for the apprenticeship system, which is responsible for training courses in areas like office and administration, electrotechnics, bakery, retail trade, installation technics.

The Mantelproject procedure aims at the identification and clarification of those elements of the occupational practice, that are considered relevant for the vocational training. Although it is recognized that there are also other elements (e.g.: general knowledge and skills, societal functioning) which are of importance for the content of vocational courses, the method explicitly does not focus on such elements (PCBB, 1983). The main goal of this method can be characterized as the supply of occupational information needed for the decision making with regard to the objectives and content of vocational courses. This information is structured in the form of a qualification and training profile which are perceived as the starting point for the course development.

The method includes nine steps which are described extensively in the manual. These steps can be condensed in the following phases:

a. Preparatory phase (formulation of the assignment, determination of the occupation(s) to be investigated, construction and testing of the questionnaire);
b. Research into the occupational practice;
c. Enrichment research (gathering of additional information);
d. Reseacrh of future developments
e. Construction of the training profile (based on all the information gathered in the preceding phases).

The main information source of this method is the occupational practice. For the research into the occupational practice, respondents employed in the occupational area under investigation, are approached with an extensive and detailled questionnaire[5]. After processing the thus gathered data by means of cluster analysis, qualification profiles are constructed and legitimized by the institution that commissioned the research. In the following phase these data are completed with additional information (e.g. performance standards, tools and means used by performance), which is thought of special interest for curriculum development. These data are also provided by job-holders. This phase results in so called enriched qualification profiles. In the phase of research of future developments, experts are questionned about the technological developments to be expected. Next to that the information from preceding phases, concerning innovative activities or tasks in existing jobs, is analyzed, resulting in the construction of 'innovative profiles' (PCBB, 1983).

This voluminous information, forms the basis for the construction of training profiles, which in their turn are the input for the curriculum development. Although the manual is very detailed in the description of preceding phases and their procedures, hardly any indications are given with regard to the transformation of the extensive information into training profiles. The same holds for the curriculum development.

b. The curriculum conference approach (Frey)

The curriculum conference approach by Karl Frey (1981, 1982) can be characterized as a group deliberation situation (of two to three days), in which representatives of different societal institutions (relevant for the subject of the conference) try to reach consensus about the objectives and content of a curriculum that has to be developed for the subject of deliberation. Although the curriculum conference was not specifically developed for the field of vocational education nor for the construction of qualification and/or training profiles based on the results of perfomance requirement analysis, the conference has in the past years often been applied for this purpose (e.g.: for the subjects of micro processors, control engineering (Frey, 1979, 1981), office automation (Mulder & Van Lent, 1988) and mechanical engineering (Mulder, 1987).

The goal of the curriculum conference is to make and legitimize curricular decisions, resulting in a model curriculum that has to be further elaborated in educational practice. A second goal of the curriculum conference is to create a learning proces for the participants (Frey, 1981).
The curriculum conference includes the following phases:

- preparation of the conference (compiling an information document; selection and invitation of conference participants; selection of experts);
- the actual conference;
- the final designing of the product.

The information document consists of a description of the central subject of the conference, in which the history of the subject as well as its present situation and the expected future developments are included. This information document forms the input for the conference. In the conference experts with regard to the subject matter and group processes are present. These experts do not play an active role in the conference, but can give clarifications or support to the conference participants on request.
During the first sessions of the conference, much attention is given to the facilitation of the group proces; instruction is given with regard to the used interaction procedures (rational

argumentation and theme-centered interaction). After this the information document is discussed and retraced to its most elementary statements. Based on the mutual shared conclusions of this discussion the construction of the model curriculum is started. Decisions with regard to objectives and content of this curriculum have to be based on consensus (Frey, 1981, 1982).

c. The conference model (SLO)

The curriculum conference model developed through the National Institution for Curriculum Development (SLO) is a strongly structured group deliberation procedure of three days. The model was developed as an answer to a question of one of the clients of the SLO, to construct a qualification and training profile as the basis for a training course for one of its target groups (Grönloh, 1984). Since the first try out the model has been applied in the areas of adult education and paramedical professions in the health care.

The aim of the conference model is to construct and legitimize a qualification and training profile in a three days conference. In this conference representatives of occupational practice participate. During the conference experts with regard to the subject matter and curriculum development are present for support of the participants.

The conference model is based on elements of the curriculum conference of Frey on the one hand and elements of the DACUM-procedure on the other hand. The preparation of the conference as well as the task differentiation between those present in the conference, show strong similarities with the curriculum conference of Frey. The structuring of the procedure within the conference relies strongly on the structure of the DACUM-workshop (Grönloh, 1984).

The conference model includes the following phases:

- preparation of the conference (compiling an information document; selection of participants and experts);
- the actual conference;
- the completion of the product and a process report.

The information document includes (similar to Frey) a description of the historical development and the present and future situation of the occupation. Next to that a description of the intentions of the trainers or training institution is included (the curriculum concept) as well as an exemplary and provisional qualification profile.

The proceeding of the conference can be described as follows:

- introduction of the procedure;
- discussion about the information document retracing it to its elementary statements;
- discussing, completing and judging the exemplary task areas and tasks included in the information document;
- determining and legitimizing the qualification profile;
- providing additional information for each of the elements of the qualification profile (performance standards and levels, tools and means used by performance);
- determining and legitimizing the training profile.

The conference has to result in a qualification and training profile, put in the format of a DACUM-chart.

5. Comparison of three cases

In this section three cases in which one of the described methods has been applied, will be compared. These three cases are the OVD-project, the Bavbo-project and the ergotherapists project.

The comparison includes the following characteristics of the projects on the proces and context level: the information base used in each project as a ground for curricular decision making and design (5.2), the procedure for the transformation of this information into a qualification and/or training profile (5.3), the length of each project (5.4). In 5.5 attention will be paid at the final outcomes of the project in terms of the realized product(s). At the end of this section (5.6) we will return to the research questions mentioned earlier.

5.1 The three cases

The OVD-project started medio 1984 and was carried out by the OVD and the PCBB. The reasons to start the project were the observed changes in the retail trade as well as the changing educational principles and opinions. The project aimed at the evaluation and updating of the whole range of training programs of the OVD, in order to create a coherent system of courses. A second goal of the project was to locate possible gaps for which new training programs should be developed. Special attention was given to the executive sales functions.

The Bavbo-project was carried out by the Department of Educational Technology of the University of Twente and was concerned with the problem of an insufficient transfer of knowledge and skills acquired at school to future occupation. This problem was especially felt in the areas of information technology and automation, where the innovations succeeded each other rapidly. The research was commissioned through the Department of Education and Science.

The research enclosed two sub-projects: one concerning office automation (OA) and one concerning flexible production automation (FPA). The goal of the project was to determine basic automation skills needed by graduates in the areas of office automation and flexible production automation. Basic skills that would have transfer potention to new situations.

The third project, the ergotherapists project, was carried out by the National Institution for Curriculum Development (SLO) and the Dutch Professional Association of Ergotherapists (NVE). The goal of this project was of a somewhat different kind from that of the other two projects. The Dutch Department of Welfare, Health and Culture felt the need to have qualification and training profiles developed for all paramedical professions in the health care. The Department therefore approached the coordinating organization of professional associations in the health care (GOB) to cooperate in a pilot project. This pilot project, the ergotherapists project, should not only result in a qualification and training profile for the ergotherapist profession but also in the adaptation of the already existing SLO method for further use in the health care. The NVE was invited to participate in this pilot project, because it had already invested considerable time in making an up to date description of the profession and the professional tasks, differentiated for the various health care sectors in which ergotherapists are employed. This available expertise was estimated of great value for the succes of the pilot project.

5.2 Information basis

Table 1 gives an overview of the main characteristics of the information basis on which curricular decisions were made in each of the projects.

Table 1. Characteristics of the information basis

	OVD	Bavbo (FPA, OA)	Ergotherapy
Information source	job-holders; experts literature	experts from business; schools, teachers; curricula; schoolleavers; literature	professionals; representatives from the ergotherapy training; documents
Sample size	550 (stratified sample);	20 + 25 (business)*; 10 + 10 (teachers)*; 62 (schools); 1215 (schoolleavers)	not applicable
Kind of information	present occupational practice (performed activities, frequency and importance of these activities); future developments with regard to information technology and automation	automation developments in business and industry (present and future); influence of real or perceived automation in the content of curricula; required basic skills, knowledge and attitudes for schoolleavers/starters with regard to automation; jobs occupied by school-leavers and the influence of automation in these jobs	history and future of the profession, present professional practice; aims and content of professional training; existing job descriptions
Respons	492	60 % (schools) 60 % (schoolleavers	not applicable
Data gathering	structured questionnaire (job-holders), literature study, interviews, conference	semi structured interviews (business, teachers) questionnaire (schools, schoolleavers) content analysis (curricula)	not applicable

* The first figures refer to the sub-project concerning flexible production automation (FPA). The figures after the adding sign refer to the sub-project concerning office automation (OA).

Table 1 shows that in the OVD-project use has been made of the relatively narrowest information base as a ground for curricular decision making. The main source of information is the occupational practice. Respondents, employed in the occupational area under investigation, were approached with an extensive questionnaire (including questions about the present occupational practice as well as background characteristics of the respondents and their working situation). A selection of these respondents was questioned about performance standards, tools and means that are used and working conditions. For this enrichment research use was made of a conference. Besides this information concerning the present

occupational practice, information was gathered about future developments in the retail trade, especially the developments in information technology and automation.
The information base in the ergotherapists project is intended to be somewhat broader. Experts (members of the NVE and trainers) were the main source of information. These experts wrote parts of the information document used in the next phase, which included information concerning the history, present and future of the ergotherapy profession as well as the professional training of ergotherapists. The information with regard to the professional training focused on the curriculum concept.
As indicated earlier the Bavbo-project included two sub-projects: office automation and flexible production automation. In both sub-projects representatives of business and industry as well as the vocational training system were asked to indicate the basic skills, knowledge and attitudes schoolleavers would need in the area of automation. In one sub-project (office automation) schoolleavers were approached with a questionnaire to get a better understanding of the jobs they found after graduation as well as the role of automation in such starting functions.

In both the Bavbo-project and the ergotherapist project the gathered information was included in an information document, which was used in the next phase of the project. This document formed the input for the decision making process concerning the educational objectives and curriculum design.

5.3 Transformation of gathered data into qualification and training profiles.

OVD

In the OVD-project the data were processed by means of cluster analysis. After several steps this analysis resulted in qualification profiles, which were legitimized through the training institution (OVD) that commissioned the research. Based on these profiles a new structure was developed for the training system.
In the other two projects a curriculum conference was used to structure the deliberation and decision process concerning the translation of the (gathered) information into qualification and/or training profiles. In table 2 the main characteristics of the transformation process are presented.

Table 2. Characteristics of the transformation procedure

	OVD	Bavbo	Ergotherapy
Procedure	clusteranalysis, no special procedure for construction of qualification profiles	curriculum conference (Frey)	curriculum conference (Frey, DACUM)
Activities included in the procedure	-	preparation of the conference; discussion and conclusion drawing with regard to the information input; determination of basic knowledge, skills and attitudes concerning automation	preparation of the conference discussion about the information input; determination of task areas and tasks within the profession; evaluation
Participants	-	business and industry; vocational training system; experts	professional practice (ergotherapists); training institutions; experts
Outcomes	qualification profiles and curricula	legitimized list of skills, knowledge and attitudes (skills and knowledge differentiated with regard to level of mastery and schooling)	legitimized and validated qualification profile

Bavbo

In the Bavbo-project two seperate conferences were organized for the area of office automation and for the area of flexible production automation, in which representatives of the vocational training system as well as business and industry participated. As a preparation the participants of the conferences received an information document some time before the conference took place. These information documents contained:

- the major results of the performance requirement analysis including a list of skills, knowlegde and attitudes that was constructed on base of the research results;
- a questionnaire concerning expectations of the curriculum conference and the assesment of the information document
- a form on which the participants were asked to score the different skills, knowledge and attitudes included in the document. For this scoring use was made of a taxonomy, differentiating educational aims in both the knowledge and skill domain into 4 levels (Olbrich & Pfeiffer, 1980).

The questionnaire and the score form were to be completed before the conference.

Each conference lasted two days. During the conferences, which were chaired by the projectmanager, subject specialists were available for the clarification of subject matter problems. The conference aimed at the construction of a list of basic knowledge, skills and attitudes with regard to automation, legitimized by the participants.
For the rating of the knowledge and skills use was made of the earlier mentioned taxonomy. This taxonomy caused some problems, especially with regard to the rating performed before the conference. The taxonomy was not clear and multi-interpretable. During the conference these problems could be solved.
The conference for the area of office automation was after the first two days continued with two seperate conferences (each of one day), to do justice to the different occupational areas included (clerical jobs and sales functions).

Ergotherapy

In the conference organized within the ergotherapist project both ergotherapists and representatives of the training institutions were involved. A few weeks before the conference an information document was sent to the participants as a preparation. This document included:

- a description of the SLO-method (its principles, aims and procedure);
- a description of the present professional practice as well as the history and expected future of the profession;
- a description of the profesional training program, with an emphasis on the curriculum concept of the training institution;
- a description of the professional tasks based on the analysis of 50 existing job descriptions. This description was intended to function as a provisional qualification profile, to facilitate the discussion during the conference;
- a questionnaire.

During the conference a subject matter specialist and a specialist with regard to curriculum development were present to provide additional information, neccessary for the decision making process.
The conference aimed at the construction and legitimation of a qualification profile as well as a training profile; for this development proces a conference of three days was planned. However, three days appeared to be insufficient; only a provisional description of the profession in the form of professional tasks was reached. About a year later a second conference was

organized, which lasted two days. In this conference the provisional description was evaluated and revised. Again time was not sufficient for also legitimizing the qualification profile. This was done afterwards by means of a written consultation of the conference participants.
Major causes of these problems were the history of the project and the mingling of aims within the project. As mentioned earlier, an up to date description of the profession was already available at the start of the project. During the proceeding of the project hardly any use was made of this material, which on the one hand resulted in a waste of time and on the other hand in mutual irritations. Next to that, the various participants in the project pursued different goals and outcomes. Additional causes were:

- lacking clarity about the division of responsibilities and tasks of the different participants;
- the critique of the ergotherapists with regard to the method itself. They qualified the method as insufficient for the analysis and description of the complexity of the profession, in which the professional attitude was tought of major importance.

5.4 Context of the projects

One of the points of critique with regard to the methods for the development of qualification and training profiles concerns their time consuming character. Application of such methods would take too much time, with the result that at the moment the results of application would be available they would already be obsoloscent. In table 3 an overview is given of the amount of time involved in the performance of each of the projects.

Table 3. Duration of the projects

	OVD	Bavbo	Ergotherapy
Date of start	August 1984	December 1984	August 1985
Date of end	January 1986*	January 1986	Octobre 1988

*: This was the moment at which the research into the occupational practice was concluded and the qualification profiles were available. Thereafter the actual curriculum development started. The first experimental curriculum materials have been implemented in the educational practice in august of this year. Expected is that these materials will become final in august of next year, after evaluation and modification.

As shown in table 3, there are quite some differences in the time, the performance of each project has taken. The Mantelproject procedure that was applied in the OVD-project claims that it is possible to finish the whole analysis within one year. The application of the method in the OVD-project has taken a few months more. But after the analysis of the occupational practice has been concluded there is still considerable time needed for the development of curriculum materials based on the results of the analysis (for the OVD-project the length of this curriculum development process is estimated at about two and a half years).
The ergotherapists project took over three years. Although this contrasts sharply with the pretentions of the SLO-method (construction, legitimation and validation of both a qualification and training profile within half a year), the problems that have arisen have to be taken into account. The first conference was held in March 1986; the second conference took place in June 1987. After this conference, considerable time has been invested by the NVE in the completion of the qualification profile. The profile was published in October 1988.
The Bavbo-project lasted about one year. The curriculum conference for the area of flexible production automation took two days and the conference for the area of office automation four days. This corresponds with the indications given by Frey (1981), who estimates the time needed for the performance of a curriculum conference at two or three days.

5.5 The outcomes of the projects

Each project has resulted in a product. In the OVD-project nine qualification profiles were constructed, which formed the input for the curriculum development. A training profile was not developed. The qualification profiles give only a description of the task areas and tasks included in each profile. Knowledge, skills and attitudes required for the performance of the function are not included. The distinction between the nine profiles are on the one hand based on performance level and on the other hand on differences between branch and company size.
At this moment three provisional curricula have been developed for primary courses in the apprenticeship system. These curricula correspond with five of the qualification profiles; the distinction based on branch has not been continued in the training programs. The provisional curricula contain the objectives for both the practical and the theoretical part of the training. The objectives for the practical part are directly derived from the qualification profile: for each task identified in this profile an objective has been formulated. The objectives of the theoretical part include the knowledge required for skilled performance as well as more general

knowledge, among which also some knowledge of automation in the retail trade. The relation between these curricula is an hierarchical one, which creates the possibility of moving up for the students.

The product which forms the outcome of the Bavbo-project is perceived as a training profile. For office automation as well as flexible production automation, the profile consists of clusters of required basic knowledge, skills and attitudes with regard to automation and information technology. The knowledge and skills are differentiated after relative importance and required level. No further indications with regard to learning content, teaching strategy, instructional materials etc. are given.

As mentioned earlier, the ergotherapists project did not result in the expected training profile, but only in the construction of a qualification profile. This qualification profile includes a description of the task areas and tasks of the ergotherapist profession, along with specifications for different sectors within the health care.

5.6 Conclusions

In the preceding sections three projects have been described in which different methods for the construction of qualification and/or training profiles were applied. We now return to the research questions concerning the characteristics, advantages and disadvantages of the methods.

In table 4 the major characteristics of the application of each method are summarized.

Table 4. Summarizing comparison of three projects

	OVD	Bavbo	Ergotherapy
Information source			
*job-holders	X	X	-
*management/training staff	-	X	-
*education/training	-	X	-
*experts	X	-	X
*literature	X	X	X
*documents	-	X	X
*otherwise (e.g. schoolleavers)	-	X	-
Kind of information			
*occupational practice	X	X	X
*future developments in occupational practice	X	X	X
*educational practice	-	X	-
*developments in education	-	X	-
*otherwise (e.g. position of schoolleavers, intentions of the training institution	-	X	X
Transformation procedure			
*specified, structured procedure	-	X	X
*no special procedure	X	-	-
Participants in decision-making process			
*business and industry/ profession	-	X	X
*education	-	X	X
Time involved	1 1/2 years	1 year	3 years

Information base

The Mantelproject procedure -applied in the OVD-project-implies a rather narrow information base as a ground for curricular decisions. As shown in the OVD-project, the gathered information focusses exclusively on the occupational practice for which job-holders are the main information source. The objectivity of the information and the representativeness of the respondents are strongly emphasized in this method.

The information base for curricular decisions and design in the conference model of the SLO (applied in the ergotherapists project) is intended to be somewhat broader. Next to information concerning the occupational practice, information about the intentions of the training institution

is included in the input for the development and decision making process. These intentions have to be taken into account especially during the development of the training profile, in the second part of the conference. However, as a cause of the problems during the subsequent conferences, no use has been made of this particular information.

In the Bavbo-project the curriculum conference appraoch of Frey has been applied. Frey's intentions with regard to the curriculum conference are to use it as a tool for the development and legitimation of a model curriculum. He therefore pays much attention to the selection of conference participants and experts as well as to the instruments and procedures to be used in the conference. Less attention is given to the information document that forms the input for the conference.
In the Bavbo-project several data gathering techniques have been used to gain information about the various factors influencing the decision making with regard to the content of vocational courses have been taken into account. This information has been translated into a structured information document, which formed the starting point for the discussion in the conference. Decisions in this project are therefore based on a broad (information) base.

Effects

Did the project lead to the intended outcomes? Looking at the different projects we can conclude that the ergotherapsists project has not been effective. Only the qualification profile has been developed after considerable time and investment of manpower. The OVD-project has reached the formulated goal. However, at the moment (after four years) only some provisional curricula are available, which correspond with a part of the constructed qualification profiles. The lack of specifications in the applied method for the transformation of all the data into training profiles or curricula, is seen as a major cause for the time consuming character of the curriculum development. The Bavbo-project aimed at the identification of basic knowledge, skills and attitudes with regard to automation and information technology. This goal has been reached: after the conclusions of the project a legitimized list of such knowledge, skills and attitudes was available.

Advantages and disadvantages

What are the major advantages and disadvantages of each method? Although final conclusions cannot yet been drawn (only a part of all the applications have been analyzed) some indications can be given with regard to this aspect.

As an advantage of the Mantelproject procedure, the objectivity and the generalizability of the gained occupational information can be seen, if at least the sampling was adequate. Next to that, it is possible by using this method to get a better understanding of a complex occupational area. However, one of the major disadvantages of this method is the voluminous information in which it results, while an adequate procedure for the transformation of this information into a training profile or curriculum is lacking. As already mentioned it still takes considerable time after the information gathering before a usable curriculum is developed. Another disadvantage is the labour-intensive character of the method. For the sake of a high response rate use is made of poll-takers. With samples carying between at least 450 and over 1000 respondents, this takes considerable time and manpower.

It is the relative low labour-intensity that forms one of the advantages of both curriculum conference approaches (if no complications show up). Next to that, the curriculum conference (both that of Frey and the SLO-model) offer a clear and structured procedure as a tool for the rather complicated transformation of occupational information into training profiles and/or curricula.

A disadvantage of the conference approaches could be the lack of objectivity and generalizability. The conferences are interactive desicion making processes in which both subjective judgements and personal interests of the participants can play an important role. In the Bavbo-project this problem has partly been solved in the use of different research techiques to gather the information that forms the input for the decision making process. It is neccessary to state that this procedure is not implied by the model of Frey. In the conference model of the SLO less attention is paid to the objectivity and generalizability of the information base. It is intended in the model to have the parts of the information document written by experts, validated through the occupational practice. However this was not realized in the ergotherapists project, due to lack of time.

It is difficult to state how much the results of the decision making processes in a curriculum conference suffer of loss of objectivty. It is to be expected that certain social-psychological factors (e.g. dominance of certain participants, the participants' habit of expressing one self in public) do play a role in such processes and are difficult to tackle. However the critique concerning subjectivity of the decisions that are made on ground of the gathered information holds also or perhaps even more for the Mantelproject procedure, in which a clearly defined and specified procedure for the decision making is lacking.

NOTES

1. This research was made possible though a grant form SVO, the Dutch Institute for Educational Research
2. In this paper only the first results of one of the research phases are presented. The research is still going on and will be concluded in april 1990. The comparative evaluation includes fifteen projects that have been carried out in the Netherlands. The research encompasses four phases. The first phase consists of a comparison of American and German literature with regard to the principles, characteristics and apllications of the methods for the construction of qualification and/or training profiles. The second phase encloses a document analysis aimed at the reconstruction of each of the projects as well as an analysis of the products that have been developed within the project. The first results of this phase are presented here.

   In the third phase interviews will be held with actors (like researchers, development agents and teachers) who have been involved in each of the projects. The last phase consists of an international experts conference concenring the question which method or mix of methods is the most adequate and suitable.
3. The term curriculum implementation is used in a two-fold way. On the one hand it indicates the actual use of a new curriculum on a certain time. On the other hand it refers to the process of implementing a new curriculum as well as to the factors influencing this proces (Wolbert, 1981; Fullan, 1982). When this proces is meant we shall speak of the implementation proces.
4. This analysis scheme directs and structures the data gathering and analysis in both the second phase of the research (document analysis) and the third phase of the research (the interview phase).
5. This questionnaire includes an extensive list of occupational activities for which the repondents are asked to indicate: whether or not the performe these activities in their job, the frequency with which activities are performed as well as the relative importance of each performed activity.

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